

CLAIMS:

- 1) A polyol composition suitable for the preparation of a rigid polyisocyanate-based foam containing one or more polyether or polyester polyols and a blowing agent, wherein;
 - 5 a) the blowing agent comprises formic acid; and
 - b) the polyol comprises an aromatic polyoxyalkylene polyol based on an initiator obtained from the condensation of a phenol with an aldehyde.
- 2) The polyol composition of Claim 1 which additionally comprises a physical blowing agent.
- 10 3) The polyol composition of Claim 2 wherein the physical blowing agent is a hydrocarbon selected from the group consisting of butane, pentane, cyclopentane, hexane, cyclohexane, and heptane, and the isomers thereof.
- 4) The polyol composition of Claim 2 wherein the physical blowing agent is a C₁-C₄ hydrofluoroalkane or hydrochlorofluoroalkane.
- 15 5) The polyol composition of Claim 4 wherein the physical blowing agent is a hydrofluoroalkane selected from the group consisting of difluoromethane, difluoroethane, tetrafluoroethane, pentafluoropropane and hexafluorobutane.
- 6) The polyol composition of Claim 1 where in the aromatic polyoxyalkylene polyol based on an initiator obtained from the condensation of phenol with formaldehyde.
- 20 7) The polyol composition of Claim 6 wherein the aromatic polyoxyalkylene polyol is present in an amount of at least 20 weight percent based on total weight of the polyol composition.
- 8) The polyol composition of Claim 7 that further comprises an aromatic polyester polyol.
- 25 9) A multi component system suitable for the preparation of rigid polyisocyanate-based foam that comprises as first component an aromatic polyisocyanate, and as second component a polyol composition as claimed in Claim 1.

- 10) A process for preparing a polyisocyanate-based foam which comprises bringing together under foam-forming conditions a polyisocyanate with a polyol composition as claimed in Claim 1.
- 5 11) The process of Claim 10 where in the polyisocyanate is present in an amount to provide for an isocyanate reaction index of from 80 to 150.
- 12) The process of Claim 10 where in the polyisocyanate is present in an amount to provide for an isocyanate reaction index of from 150 to 600.
- 13) A polyurethane foam obtained by bringing together under foam-forming conditions a polyisocyanate with a polyol composition characterized in that:
- 10 a) the polyisocyanate is present in an amount to provide for an isocyanate reaction index of from 80 to 150; and
- b) the polyol composition comprises (i) formic acid; and (ii) an aromatic polyoxyalkylene polyol based on an initiator obtained from the condensation of a phenol with an aldehyde.
- 15 14) A polyisocyanurate foam obtained by bringing together under foam-forming conditions a polyisocyanate with a polyol composition characterized in that:
- a) the polyisocyanate is present in an amount to provide for an isocyanate reaction index of from 150 to 600; and
- 20 b) the polyol composition comprises (i) formic acid; and (ii) an aromatic polyoxyalkylene polyol based on an initiator obtained from the condensation of a phenol with an aldehyde.
- 15) A laminate comprising the foam of Claim 13 or Claim 14.
- 25 16) A process for preparing a closed-celled polyisocyanurate foam by bringing into contact under foam-forming conditions a polyisocyanate with a polyol composition in the presence of a blowing agent mixture wherein the polyol composition comprises an aromatic polyester polyol and an aromatic polyether polyol; and wherein the blowing agent mixture comprises formic acid and a hydrofluoroalkane selected from the group

consisting of tetrafluoroethane, pentafluoropropane, heptafluoropropane and pentafluorobutane, and characterized in that the polyisocyanate is present in an amount to provide for an isocyanate reaction index of from greater than 150 to 600.

17) The process of Claim 16 wherein water is present in an amount of from 0 to 2 parts by weight per 100 parts of the combined weight of the polyol composition and blowing agent mixture.

18) The process of Claim 16 wherein the aromatic polyether polyol comprises a toluenediamine-initiated polyol, a Mannich base-initiated polyol, a methylene diphenylamine-initiated polyol, a phenol-acetone condensate-initiated polyol or a phenol-formaldehyde condensate-initiated polyol.

19) A process for preparing a closed-celled polyisocyanurate foam by bringing into contact under foam-forming conditions a polyisocyanate with a polyol composition in the presence of a blowing agent mixture wherein the polyol composition comprises an aromatic polyester polyol and an aromatic polyether polyol; and wherein the blowing agent mixture comprises formic acid and a hydrocarbon selected from the group consisting of butane, pentane, cyclopentane, hexane, cyclohexane, and heptane, and the isomers thereof and characterized in that the polyisocyanate is present in an amount to provide for an isocyanate reaction index of from greater than 150 to 600.

20) The process of Claim 16 or 19, wherein the polyisocyanate is an aromatic polyisocyanate having on average from 2.8 to 3.2 isocyanate groups per molecule.

21) A two component foam forming system that comprises:

a) an aromatic polyisocyanates having an average of from 2.8 to 3.2 isocyanate groups per molecule; and

b) a polyol composition that contains (i) an aromatic polyester polyol and an aromatic polyether polyol; and (ii) a blowing agent mixture which comprises formic acid and a hydrofluoroalkane selected from the group consisting of tetrafluoroethane, pentafluoropropane, heptafluoropropane and pentafluorobutane.

22) A two component foam forming system that comprises:

a) an aromatic polyisocyanates having an average of from 2.8 to 3.2 isocyanate groups per molecule; and

b) a polyol composition that contains: (i) an aromatic polyester polyol and an aromatic polyether polyol; and (ii) a blowing agent mixture which comprises formic acid and a hydrocarbon selected from the group consisting of butane, pentane, cyclopentane, hexane, cyclohexane, and heptane, and the isomers thereof.